

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: ORTBERG ET AL. Examiner: T. NGUYEN  
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Assignee: ADC TELECOMMUNICATIONS, INC.  
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Title: RF CIRCUIT MODULE AND CHASSIS INCLUDING AMPLIFIER

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By: 

Name: Chris Stordahl

PRELIMINARY AMENDMENT

Box Reissue  
Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

Prior to examination of the above-identified Reissue Application, please amend the application as follows:

IN THE CLAIMS

Please add claims 10-44 as follows.

10. A chassis frame and module combination comprising:

a) an amplifier module having:

1) a housing defining an enclosed interior; said housing having a front face and an opposite rear face separated by opposite sidewalls and opposite end walls, each of said end walls having a projecting flange;

2) two coax connectors secured to said rear face with an outer shield of said coax connectors electrically coupled to said housing;

3) circuitry contained within said housing; said circuitry including an amplifier circuit selected to amplify a radio frequency signal supplied to one of said coax connectors and to provide an amplified radio frequency signal to the other of said connectors;

4) a power supply port operatively coupled to said amplifier circuit;

b) a chassis frame including a pair of spaced apart walls, said walls spaced apart by a distance substantially equal to a distance between said end walls of said module; each of said walls including a groove sized to slidably receive one of said projecting flanges;

c) a power downconverter separate from said amplifier module, said power downconverter mounted to said chassis frame, said power downconverter electrically coupled to said power supply port of said amplifier module for powering said amplifier circuit.

11. The chassis frame and module of claim 10 wherein the power supply port is located on said rear face of said housing.

12. The chassis frame and module of claim 10 wherein the power downconverter is a transformer.

13. The chassis frame and module of claim 10 further comprising a lock member for locking said housing to said chassis frame.

14. The chassis frame and module of claim 10 wherein said circuitry includes a circuit board having a component side and a ground side, said ground side including a layer of electrically conductive material electronically connected to said housing and a plurality of connection locations on said circuit board, each of said connection locations including a ground connection for connecting ground shields of coax cables to said layer of electrically conductive material.

15. The chassis frame and module of claim 14 wherein said component side includes a circuit component interconnected with said connection locations through a circuit path and a circuit component operatively coupled to the component interconnect.

16. The chassis frame and module of claim 10 wherein said housing is made of an electrically conductive material.

17. The chassis frame and module of claim 10 wherein said faces and sidewalls of said housing being of predetermined dimension and said side walls being parallel to one another and each projection extending in a common plane generally parallel to said sidewalls with said common plane generally parallel to said sidewalls and offset from a central longitudinal axis of said housing.

18. The chassis frame and module of claim 13 wherein said front face has end portions extending beyond each of said end walls and said lock member locking at least one of said end portions to said chassis frame.

19. The chassis frame and module of claim 14 wherein said coax connectors are connected to said connection locations, each of said outer shields of said coax connectors coupled to said ground connections of said connection locations.

20. The chassis frame and module of claim 10 further comprising a first test coax connector secured to said front face; said first test coax connector electrically coupled to a circuit path of said circuitry to monitor the radio frequency signal supplied to said amplifier circuit.

21. The chassis frame and module of claim 20 further comprising a second test coax connector secured to said front face; said second test coax connector electrically coupled to a circuit path of said circuitry to monitor the radio frequency signal from said amplifier circuit.

22. The chassis frame and module of claim 10 further comprising a test coax connector secured to said front face; said test coax connector electrically coupled to a circuit path of said circuitry to monitor the radio frequency signal from said amplifier circuit.

23. The chassis frame and module of claim 10 wherein said circuitry of said amplifier module further includes a tilt circuit.

24. The chassis frame and module of claim 10 wherein said circuitry of said amplifier module further includes a power on indicator, said power on indicator including an LED positioned on said front face.

25. The chassis frame and module of claim 10 wherein said circuitry of said amplifier module further includes a gain potentiometer, and said front face including an adjustment access point to adjust said gain potentiometer.

26. The chassis frame and module of claim 12 further comprising a transformer module for holding the transformer, the transformer module having a housing with a front face, a rear face, opposite sidewalls and end walls, each of the end walls having a projecting flange, each projecting flange received in one of the pairs of aligned grooves of the walls of the chassis frame.

27. The chassis frame and module of claim 10 wherein the pair of spaced apart walls is a first pair, and wherein the chassis frame includes a second pair of spaced apart walls spaced apart a distance substantially equal to the first pair, each wall of the second pair including a flange receiving groove for receiving an additional radio frequency module configured and arranged with a housing like the housing of the amplifier module.

28. A chassis frame and module combination comprising:

a) an amplifier module having:

1) a housing defining an enclosed interior; said housing having a front face and an opposite rear face separated by opposite sidewalls and opposite end walls;

2) two coax connectors secured to said rear face with an outer shield of said coax connectors electrically coupled to said housing;

3) circuitry contained within said housing; said circuitry including an amplifier circuit selected to amplify a radio frequency signal supplied to one of said coax connectors and to provide an amplified radio frequency signal to the other of said coax connectors;

4) a power supply port operatively coupled to said amplifier circuit;

b) a chassis frame including a pair of spaced apart walls, said walls spaced apart by a distance substantially equal to a distance between said end walls of said module;

c) a power downconverter separate from said amplifier module, said power converter mounted to said chassis frame, said power downconverter electrically coupled to said power supply port of said amplifier module for powering said amplifier circuit.

29. The chassis frame and module of claim 28 wherein the housing has end portions and the retainer is a lock member that locks at least one of said end portions to said chassis frame.

30. The chassis frame and module of claim 28 wherein the power supply port is located on said rear face of said housing.

31. The chassis frame and module of claim 28 wherein the power downconverter is a transformer.

32. The chassis frame and module of claim 28 wherein said circuitry includes a circuit board having a component side and a ground side, said ground side including a layer of electrically conductive material electronically connected to said housing and a plurality of connection locations on said circuit board, each of said connection locations including a ground connection for connecting ground shields of coax cables to said layer of electrically conductive material.

33. The chassis frame and module of claim 32 wherein said component side includes a circuit component interconnected with said connection locations through a circuit path and a circuit component operatively coupled to the component interconnect.

34. The chassis frame and module of claim 28 wherein said housing is made of an electrically conductive material.

35. The chassis frame and module of claim 28 wherein said faces and sidewalls of said housing being of predetermined dimension and said side walls being parallel to one another and each projection extending in a common plane generally parallel to said sidewalls with said common plane generally parallel to said sidewalls and offset from a central longitudinal axis of said housing.

36. The chassis frame and module of claim 32 wherein said coax connectors are connected to said connection locations, each of said outer shields of said coax connectors coupled to said ground connections of said connection locations.

37. The chassis frame and module of claim 28 further comprising a first test coax connector secured to said front face; said first test coax connector electrically coupled to a circuit path of said circuitry to monitor the radio frequency signal supplied to said amplifier circuit.

38. The chassis frame and module of claim 37 further comprising a second test coax connector secured to said front face; said second test coax connector electrically coupled to a circuit path of said circuitry to monitor the radio frequency signal from said amplifier circuit.

39. The chassis frame and module of claim 28 further comprising a test coax connector secured to said front face; said test coax connector electrically coupled to a circuit path of said circuitry to monitor the radio frequency signal from said amplifier circuit.

40. The chassis frame and module of claim 28 wherein said circuitry of said amplifier module further includes a tilt circuit.

41. The chassis frame and module of claim 28 wherein said circuitry of said amplifier module further includes a power on indicator, said power on indicator including an LED positioned on said front face.

42. The chassis frame and module of claim 28 wherein said circuitry of said amplifier module further includes a gain potentiometer, and said front face including an adjustment access point to adjust said gain potentiometer.

43. The chassis frame and module of claim 31 further comprising a transformer module for holding the transformer, the transformer module having a housing with a front face, a rear face, opposite sidewalls and end walls, each of the end walls having a projecting flange, each projecting flange received in one of the pairs of aligned grooves of the walls of the chassis frame.

44. The chassis frame and module of claim 28 wherein the pair of spaced apart walls is a first pair, and wherein the chassis frame includes a second pair of spaced apart walls spaced apart a distance substantially equal to the first pair, each wall of the second pair including a flange receiving groove for receiving an additional radio frequency module configured and arranged with a housing like the housing of the amplifier module.

## REMARKS

Original claims 1-9 from U.S. Patent No. 5,966,648 are pending. New claims 10-44 have been added by this amendment.

Independent claim 10 relates to claim 1 of the '648 patent having changes including elimination of the terms from claim 1 in bracket and the addition to claim 1 of the underlined terms as shown below:

- [1.] 10. A chassis frame and module combination comprising:
- a) an amplifier module having:
    - 1) a housing [of electrically conductive material] defining an enclosed interior; said housing having a front face and an opposite rear face separated by opposite sidewalls and opposite end walls, [with each of said faces and sidewalls being of predetermined dimension and with said sidewalls being parallel to one another;] each of said end walls having a projecting flange [extending in a common plane generally parallel to said sidewalls and with said common plane offset from a central longitudinal axis of said housing; said front face including end portions extending beyond each of said end walls];
    - 2) two coax connectors secured to said rear face with an outer shield of said coax connectors electrically coupled to said housing;
    - 3) [a circuit board] circuitry contained within said housing [interior and positioned generally parallel to and spaced between said sidewalls]; said circuitry [circuit board having a component side opposing a first of said sidewalls and a ground side opposing a second of said sidewalls, said ground side including a layer of electrically conductive material electrically connected to said housing; a plurality of connection locations on said circuit board, each of said connection locations including a ground connection for connecting ground shields of coax cables to said layer of electrically conductive material; said component side of said circuit board] including [a circuit component interconnected with said connection locations through a circuit path; said circuit component including] an amplifier circuit selected to amplify a radio frequency signal supplied to one of said coax connectors and to provide an amplified radio



frequency signal to the other of said coax connectors; [said coax connectors connected to said connection locations, each of said outer shields of said coax connectors connected to said ground connections of said connection locations];

4) [A] a power supply port [located on said rear face, said power supply port interconnected] operatively coupled to said amplifier circuit [through a circuit path of said circuit board];

b) a chassis frame including a pair of spaced apart walls, said walls spaced apart by a distance substantially equal to a distance between said end walls of said module; each of said walls including a groove, [each groove] sized to slidably receive one of said projecting flanges;

[c] a lock member for locking at least one of said end portions to said chassis frame;]

[d] c) a [transformer] power downconverter separate from said amplifier module, said [transformer] power converter mounted to said chassis frame, said [transformer] power downconverter electrically coupled to said power supply port of said amplifier module for powering said amplifier circuit.

Independent claim 28 relates to claim 1 of the '648 patent having changes including elimination of terms from claim 1 in bracket and the addition to claim 1 of the underlined terms as shown below:

[1.] 28. A chassis frame and module combination comprising:

a) an amplifier module having:

1) a housing [of electrically conductive material] defining an enclosed interior; said housing having a front face and an opposite rear face separated by opposite sidewalls and opposite end walls, [with each of said faces and sidewalls being of predetermined dimension and with said sidewalls being parallel to one another; each of said end walls having a projecting flange extending in a common plane generally parallel to said sidewalls and with said common plane offset from a central longitudinal axis of said housing; said front face including end portions extending beyond each of said end walls];

2) two coax connectors secured to said rear face with an outer shield of said coax connectors electrically coupled to said housing;

3) [a circuit board] circuitry contained within said housing [interior and positioned generally parallel to and spaced between said sidewalls]; said circuitry [circuit board having a component side opposing a first of said sidewalls and a ground side opposing a second of said sidewalls, said ground side including a layer of electrically conductive material electrically connected to said housing; a plurality of connection locations on said circuit board, each of said connection locations including a ground connection for connecting ground shields of coax cables to said layer of electrically conductive material; said component side of said circuit board] including [a circuit component interconnected with said connection locations through a circuit path; said circuit component including] an amplifier circuit selected to amplify a radio frequency signal supplied to one of said coax connectors and to provide an amplified radio frequency signal to the other of said coax connectors; [said coax connectors connected to said connection locations, each of said outer shields of said coax connectors connected to said ground connections of said connection locations];

4) [A] a power supply port [located on said rear face, said power supply port interconnected] operatively coupled to said amplifier circuit [through a circuit path of said circuit board];

b) a chassis frame including a pair of spaced apart walls, said walls spaced apart by a distance substantially equal to a distance between said end walls of said module; [each of said walls including a groove, each groove sized to slidably receive one of said projecting flanges;]

c) a [lock member] retainer for [locking at least one of said end portions to] retaining said housing in said chassis frame;

[d] c) a [transformer] power downconverter separate from said amplifier module, said [transformer] power converter mounted to said chassis frame, said [transformer] power downconverter electrically coupled to said power supply port of said amplifier module for powering said amplifier circuit.

Dependent claims 11-19 and 29-36 add various features found in claim 1 but not in new claims 10 and 28. New dependent claims 20-27 and 37-44 relate to claims 2-9 of the '648 patent.

Respectfully submitted,

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